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mparative Biology of Salticid Spiders at Rancho Grande, Venezuela. Part III. Systematics and Behavior in Representative New Species.[1]

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(Text-figures 1-8).

[This is one of a series of papers resulting m the 45th, 46th and 47th Expeditions of the partment of Tropical Research of the New rk Zoological Society, made during 1945, 1946 d 1948, under the direction of Dr. William ebe, with headquarters at Rancho Grande in National Park of Aragua, Venezuela. The peditions were made possible through the nerous cooperation of the National Govern- nt of Venezuela and of the Creole Petroleum rporation.

[The characteristics of the research area are brief as follows: Rancho Grande is located north-central Venezuela (10° 21′ N. Lat., ° 41′ W. Long.), 80 kilometers west of Cara- s, at an elevation of 1,100 meters in the undis- rbed montane cloud forest which covers this rt of the Caribbean range of the Andes. Ad- cent ecological zones include seasonal forest, vanna, thorn woodland, cactus scrub, the esh water Lake Valencia, and various ma- ne littoral zones. The Rancho Grande area is nerally subtropical, being uniformly cool and mp throughout the year because of the preva- nce of the mountain cloud cap. The dry season tends from January into April. The average midity during the expeditions, including arts of both wet and dry seasons was 92.4%; ne average temperature during the same period as 18° C.; the average annual rainfall over a -year period was 174 cm. The flora is marked y an abundance of mosses, ferns and epiphytes f many kinds, as well as a few gigantic trees. or further details, see Beebe & Crane, *Zoolog- a*, Vol. 32, No. 5, 1947. Unless otherwise stated, ne specimens discussed in the present paper ere taken in the montane cloud forest zone, ithin a radius of 1 kilometer of Rancho rande.]

CONTENTS.

[1] Contribution No. 840, Department of Tropical Research, New York Zoological Society.

INTRODUCTION.

The eight species described in the present paper have been selected from among other Rancho Grande salticids for two reasons. First, they represent a number of different stages and directions in salticid evolution; and, second, special experimental display data and/or examples of the earliest instars have been assembled in each. Part I of this series (Crane, 1948.1) dealt monographically with several species of *Corythalia*, while Part II (1948.2) described the methods of study. In the succeeding parts, which will be based largely on *Corythalia* and the present group of species, it is proposed to discuss the releasing mechanisms of display, to compare post-embryological development and, finally, to evaluate evolutionary trends.

With the exception of Text-figure 8F, which was drawn from life at Rancho Grande by Mr. Kenneth Gosner, all the illustrations are the work of Miss Louise A. Moore.

The types are deposited in the collections of the Department of Tropical Research, New York Zoological Society, New York 60, N. Y.

Lyssomanes bradyspilus sp. nov.

(Text-fig. 1).

Diagnosis: Retromargin of fang groove with 6 teeth, the 2 proximal minute, none crowded toward fang base; basal segment of chelicera in male with cluster of 3 to 7 dorsal distal spines; fang toothless; no fringes on first metatarsi, which are straight; no cluster of dorsal tibial spines on palp, its distal apophysis very small, blunt; bulb with three strong, spinous, distal processes; epigynum with two pairs of large rounded bodies distinct, the anterior pair the smaller and practically contiguous. Abdominal black spots present or absent.

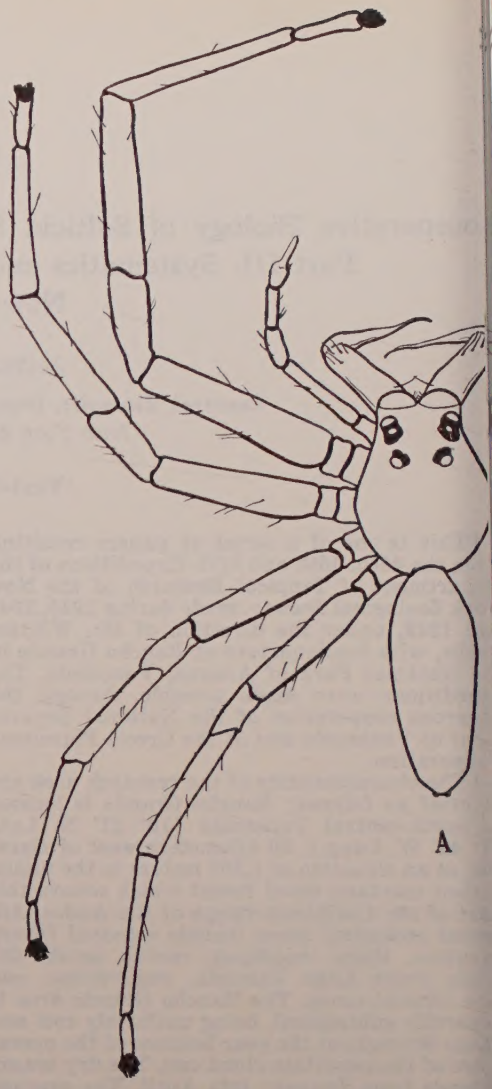
COLOR.

Color in Life: Adult male. Cephalothorax: Integument of carapace translucent green, without dark pigment, varying from a yellowish-green, especially in recently molted

examples, to apple green (Ridgway). Ocular quadrangle including black eye tubercles with varying amounts and proportions of yellowish- or silvery white and orange-red scale hairs, the latter usually placed anteriorly. AME rimmed with silvery-white; the eyes themselves clear apple green, shifting to black (see under BEHAVIOR); other eyes black. A narrow submarginal clypeal band of orange-red scale hairs, directed downward. Chelicerae fangs brown. Palpal bulbs pinkish to orange. Integument of legs translucent apple green, without dark pigment except for black tarsal pads. Abdomen: Integument translucent green, sparsely covered with short hairs, ranging from apple green to dull green-yellow, usually with a short, median basal stripe of darker green. Hairs short, rather sparse, of same color as integument. Paired, subdermal black spots on posterior half of abdomen present or absent, strong or weak, rarely appearing—if at all —until three or four days after final molt; any number up to four pairs may develop. A patch of white hairs often present at distal end of dorsum.

Adult female. Differs from male as follows: Scale hairs of ocular quadrangle, including eye tubercles, tend to be more uniformly yellowish- or silvery white, with the orange-red reduced or absent, except for a variable, sometimes conspicuous, crest behind AME; subdermal clypeal band of orange-red absent, replaced by a band of scant white hairs; palps completely green; legs usually with some dark subdermal pigment concentrated near joints; this often is confined to a single spot in antero-distal part of first tibia. As in the case of the abdominal spots, it develops, if at all, after the final molt. No female seen with more than two pairs of abdominal spots; as in the male, they develop slowly or not at all.

Color in Alcohol: All green fades promptly, as usual in the genus, to yellowish-white; no black leg or abdominal pigment remains; on the other hand, the orange-red clypeal band of males and the crest of females are strongly persistent and even intensified.



TEXT-FIG. 1. (Part). *Lyssomanes bradyspilu* A-D holotype ♂: **A**, dorsal view; **B**, chelicer ventral view; **C**, left palp, ventral view; same, ectal view. **E**, paratype ♀: epigynum.

STRUCTURE.

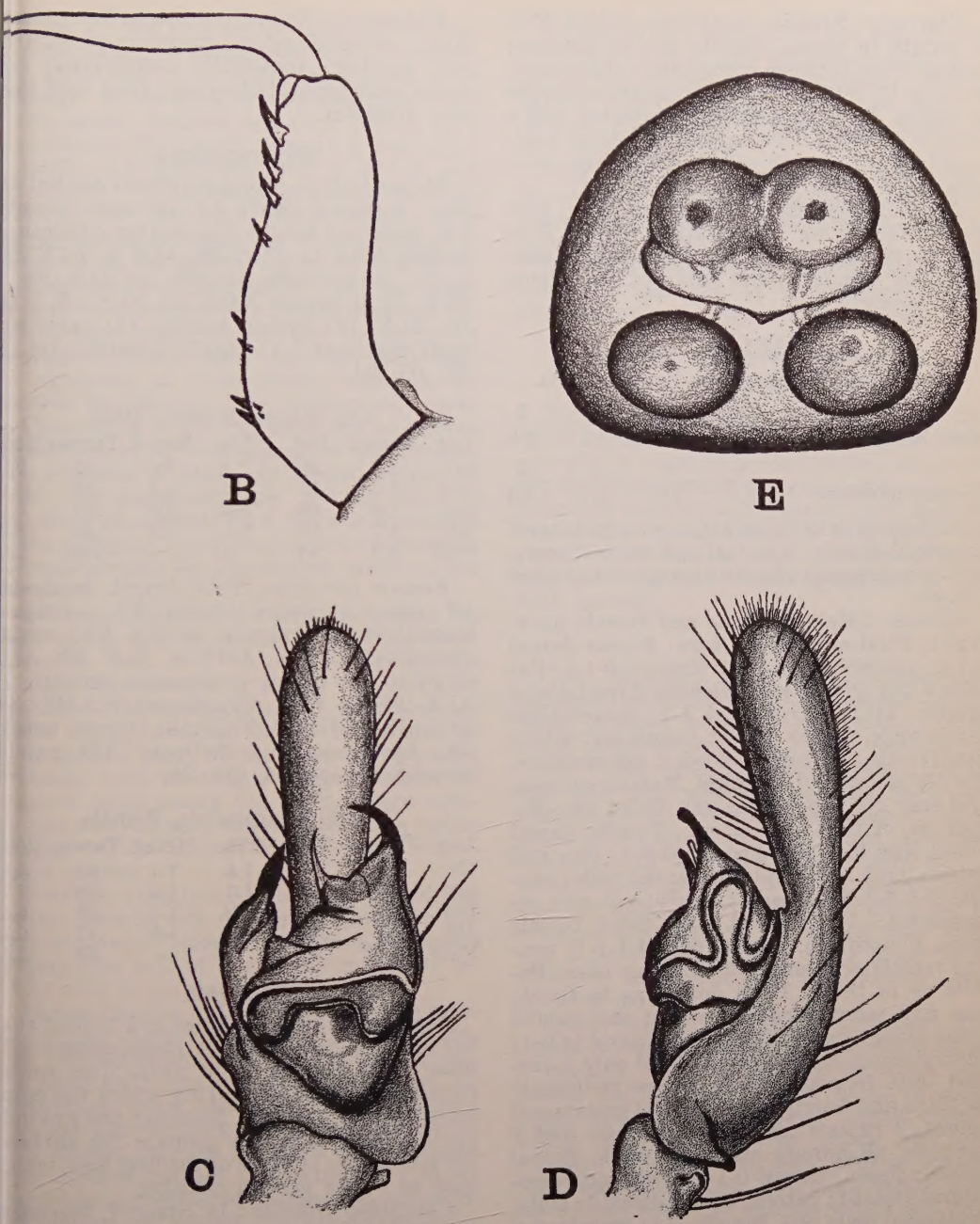
Characteristics below apply to both males and females unless otherwise specified; percentages approximated; measurements of types given on p. 34.

Carapace: Height, including tubercle of PLE, scarcely more than half length; short anterior part of thoracic slope almost level, descent of posterior part moderate; width greatest midway between PLE and pedicel, wider in male (1.5 times height, 79% of length), narrower in female (1.35 times height, 71% of length); longitudinal thoracic groove well developed, lying midway between PLE and pedicel.

Eyes: Eight eyes in four distinct rows; all except AME elevated on low black tubercles, the PME on same tubercle as ALE. First row 87% as wide as second; length of ocular quadrangle including AME 42% carapace length, length from ALE to PL 27%; breadth at ALE much wider than PLE, 46% and 34% of length respectively ocular quadrangle length from ALE to PL only 66% of its breadth at ALE. Diameter AME 21% of carapace length: ratio of eyes AME: ALE: PME: PLE: :100: 42: 11. 35. AME practically contiguous, separate from ALE by about a tenth of their dian eter; PME slightly closer to ALE than PLE.

Clypeus: Height in males 38% of AM diameter; 54% in females.

Chelicerae: In males, strongly produce but of variable length, porrect, robust, dive gent. Length of basal segment in best deve oped more than half carapace length, in lea developed about half. Each with 1-2 prs. overlapping spines near base on medial fro



TEXT-FIG. 1. (Part). *Lyssomanes bradyspilus*. A-D, holotype ♂: **A**, dorsal view; **B**, chelicera, ventral view; **C**, left palp, ventral view; **D**, same, ectal view. **E**, paratype ♀: epigynum.

nargin, and a group of 3 to 7 strong distal pines, the number and arrangement varying ven on two sides of same individual. Fang lender and sinuous, toothless; groove weak; romargin with three small teeth near base, he smallest proximal, it and the next closer ogether than second and third; no tooth at ase of fang; inferior margin typically with teeth in a straight row, increasing in size listally, along entire edge of groove. The asal one or two, however, although apparntly constant, are minute, delicate and asily destroyed; they are separated considerably from each other and the distal 4, which are quite evenly spaced. In females the chelicerae are, of course, much shorter; distal spine group absent; teeth closer together, tending to be evenly spaced throughout and of more nearly equal size.

Maxillae: Parallel; width 60% of length; distal dilation slight; external angle evenly rounded without tubercle.

Lip: Breadth 90% of length; basal excavation extending 25% of length; distal end reaching slightly beyond middle of maxillae; sternal suture straight.

Sternum: Broadly scutiform; width 85% of length in males, slightly less in females; equally wide between second and third coxae; base of lip 60% as wide as anterior border in males, 50% in females; posterior end a bluntly rounded lobe extending about halfway between fourth coxae, which are separated by two-thirds of their diameter.

Legs: Tibial indices: Holotype male, first leg 12, fourth leg 11; paratype female, first and fourth legs, 13. First legs of male considerably elongated and enlarged. See Table I for formula.

TABLE I.

Lyssomanes bradyspilus: Leg Formula.

	1	2	4	3
Male holotype	3.8	3.0	3.0	2.9
	1	4	2	3
Female paratype	3.2	2.9	2.7	2.6

All legs with little hair; hairs on metatarsi arranged clearly in dorsal and ventral rows, but in no sense profusely enough to be called fringes.

Spines: (Male holotype and female paratype). First and second legs: Femur dorsal 1-1-1; prolateral and retrolateral 0-1-1. Patella 0 but with a long, slender dorsal distal bristle. Tibia: Prolateral 1-1; retrolateral 1-1 in male, and on second female leg, 0-1 on first female leg; ventral 2-0-2-2, not opposite, the distal ones not terminal. Metatarsus ventral only 2-2-2, not terminal. Third leg: Femur as in first and second. Patella dorsal distal only 1. Tibia, dorsal 1-0-0-1; pro- and retrolateral, as in first and second male; ventral 0-0-2-0. Metatarsus, prolateral and retrolateral 1-1-0; ventral, male, 2-0-0, female none. Fourth leg: Femur dorsal 1-1-1; pro- and retrolateral male 0-0-1, female none. Patella as in third. Tibia dorsal as in third; pro- and retrolateral as in first and second male, except fourth female prolateral is 0-1; ventral none. Metatarsus ventral only 1 (retro) -0-0. In addition, there are rudiments on third and fourth legs of distal metatarsal spines, 2 prolaterals, 2 retrolaterals and 2 ventrals, all minute and very weak. Palpal spines: Femur dorsal 0-1-1; pro- and retrolateral distal 1; patella, dorsal distal 1; tibia, prolateral male, 0-1, female, 1-1; metatarsus female, dorsal 1-0; pro and retrolateral 1-1.

Abdomen: About 3 times longer than broad in males and young females, tapering from level of genital groove; anal tubercle not pronounced; vestigial colulus not indicated.

Palp: Femur slightly curved; patella and tibia nearly equal; tibia without dorsal spine cluster; tibial apophysis scarcely more than a truncate tubercle opposing basal ridge of tarsus; bulb with three pointed distal processes, variously shaped, and a distal tubercle (see Text-fig. 1), the whole complex structure differing only in proportions and details from Chickering's description of the palp in *L. banksi* (1946, p. 12).

Epigynum: No median notch. Two pairs o large, rounded bodies; members of anterio pair smaller, apparently contiguous; pos terior pair separated by less than half thei own diameter.

MEASUREMENTS.

Male holotype. Total length in alcohol 4.7 mm.; carapace length 2.1; carapace breadt 1.6; carapace height 1.1; ocular quadrangl length, AME to PLE .89, ALE to PLE .58 ocular quandrangle breadth, at ALE .96, a PLE .72; diameter AME .45, ALE .19, MLE .05, PLE .15; clypeus height .17; basal seg ment chelicera 1.1; patella breadth, 1st leg .38, 4th .24.

Leg Measurements, Male.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Tota
1st	2.3	.96	2.1	2.0	.55	7.9
2nd	1.9	.75	1.6	1.7	.41	6.4
3rd	1.8	.68	1.4	1.7	.41	6.0
4th	1.7	.65	1.5	1.9	.44	6.2
Palp	1.0	.44	.41	—	.58	2.4

Female paratype. Total length in alcoho 4.7 mm.; carapace length 2.1; carapace breadth 1.5; carapace height 1.1; ocular quadrangle length, AME to PLE .89, ALE to PLE .65; ocular quadrangle breadth, at ALE .99, at PLE .72; diameter AME .45 ALE .19, AME .05, PLE .15; clypeus height .24; basal segment chelicera .75; patella breadth 1st leg .34, 4th .24.

Leg Measurements, Female.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Tota
1st	2.0	.79	1.8	1.7	.41	6.7
2nd	1.7	.75	1.4	1.5	.38	5.7
3rd	1.6	.68	1.2	1.5	.38	5.4
4th	1.9	.55	1.4	1.8	.41	6.1
Palp	.82	.44	.44	—	.68	2.4

BEHAVIOR.

Locomotion: This species is a typical runner; I have never seen it jump, except in a final short pounce upon prey. The spider runs in brief spurts, during which the palps hang down practically touching the ground; during the pause they palpate the surface. No special use is made of the first legs, which take an active part in running.

Courtship Display: In Stage I, the carapace is held high, the first three pairs of legs braced somewhat forward, obliquely, and the fourth pair back; the palps hang over chelicerae, now and then tapping ground, while the abdomen hangs straight down. To superficial observation, the display consists only of posing in this position, varied with occasional bobbing of the carapace and twitching of the abdomen during rising excitement. Not until Stage II is reached, within touching distance of the female, are the first legs raised; they are then extended to the front while the carapace sinks low and the abdomen is swung back in the horizontal position.

When the spiders are observed from their own level, however, in a straight front view it is obvious that during display the rate of

ttivity of the muscles controlling the an-rro-median eyes is considerably increased; iis gives rise to a much accelerated color hange" of the eyes, from green to black to reen again. Similar eye color shifts have een known for many years in a few other lticids (e.g. Bristowe 1941, p. 419 ff. and ferences). It is apparently caused by slight cotions of the long, cone-shaped optic cups," possibly concerned with a change in ocus, or in the lateral range of vision, al-ough the exact mechanism does not seem have been worked out. In *Lyssomanes* the ifts take place slowly but continuously uring ordinary daily activity, and may e observed at close range under a bi-ocular microscope. The mechanism works adependently in the two eyes, and at a given astant either or both eyes show any propor-on of green or black. To human beings, at east, the asymmetrically rolling effect is artling. In a dorsal view, the slight motions f the elongate "cups" may be simultaneously iewed through the translucent cuticle of the arapace.

Bristowe suggests the possibility that the olor shifts may be useful in enticing prey. owever that may be, after the Rancho rande observations it seems to me highly robable that acceleration of muscular ac-vity during display should be considered s a definite part of the behavior pattern, robably with an adaptive significance; its elative value among the various sign stim-li has not yet been established. This entire ubject will be further considered in subse-uent papers.

Once her attention has been attracted, the emale usually sits quietly, sagging to one ide on several folded legs; during the male's isplay, the rate of her ocular muscular ac-ivity also is increased.

Threat Display: Males usually took no no-ice of one another, and were induced to dis-lay only three times. During these periods, ye color shift was not especially noted. No ifferences were observed between threat osition and activity from those of court-hip, except that the carapace and abdomen ere neither bobbed nor twitched. I never aw the long chelicerae unsheathed, although wice there was a brief, butting skirmish be-ore one opponent retreated.

Habitat: Known only from the cloud forest ear Rancho Grande. Shaken from green erbs, shrubs and low trees; one example aken from an epiphytic bromeliad growing wenty feet from the ground.

Affinities: This species holds its chief haracteristics in common with a number of *yssomanes*, although their combination eems quite distinct. *L. quadrinotatus* Simon, 1900), from nearby mountains, has only hree teeth on inferior margin of fang roove.

Material: A total of 7 adult males and 4 emales have been preserved in addition to number of young. The following have been esignated as types:

HOLOTYPE: Male. Cat. No. 461199, Department of Tropical Research, New York Zoological Society; Portachuelo, Rancho Grande, near Maracay, National Park of Aragua, Venezuela; 1136 meters; cloud forest; March 20, 1946.

PARATYPE: Female. Cat. No. 45450, Department of Tropical Research, New York Zoological Society; same locality as holotype; July 9, 1945.

The name *bradyspilus* is proposed in reference to the delayed development of the black markings after the final molt.

Semorina brachychelyne sp. nov.

(Text-fig. 2).

Diagnosis: Small, brown, scale-less salticids, carapace low, abdomen long and narrow with a very slight constriction near middle, first legs greatly elongated and enlarged, extended forward and scarcely used in walking, while the abdomen is frequently elevated. Chelicerae in male scarcely a fourth length of carapace; tibial apophyses of palp both curved.

Color.

Color in Life: Adult male. Carapace integument dark brown, without scales and almost without hairs, except around eyes. AME clear ochraceous brown shifting to black. Palps dark. First legs brown, the femur and tibia almost black, the tarsi and sometimes the metatarsi translucent horn-color. Other legs translucent horn. Abdomen covered with fine dark brown hairs with a pair of small spots of white hairs (not scales and not shiny or iridescent) three-fifths of distance from base to tip. In one male there was a pair of faint pale spots near tip of abdomen in addition to the distinct more anterior pair.

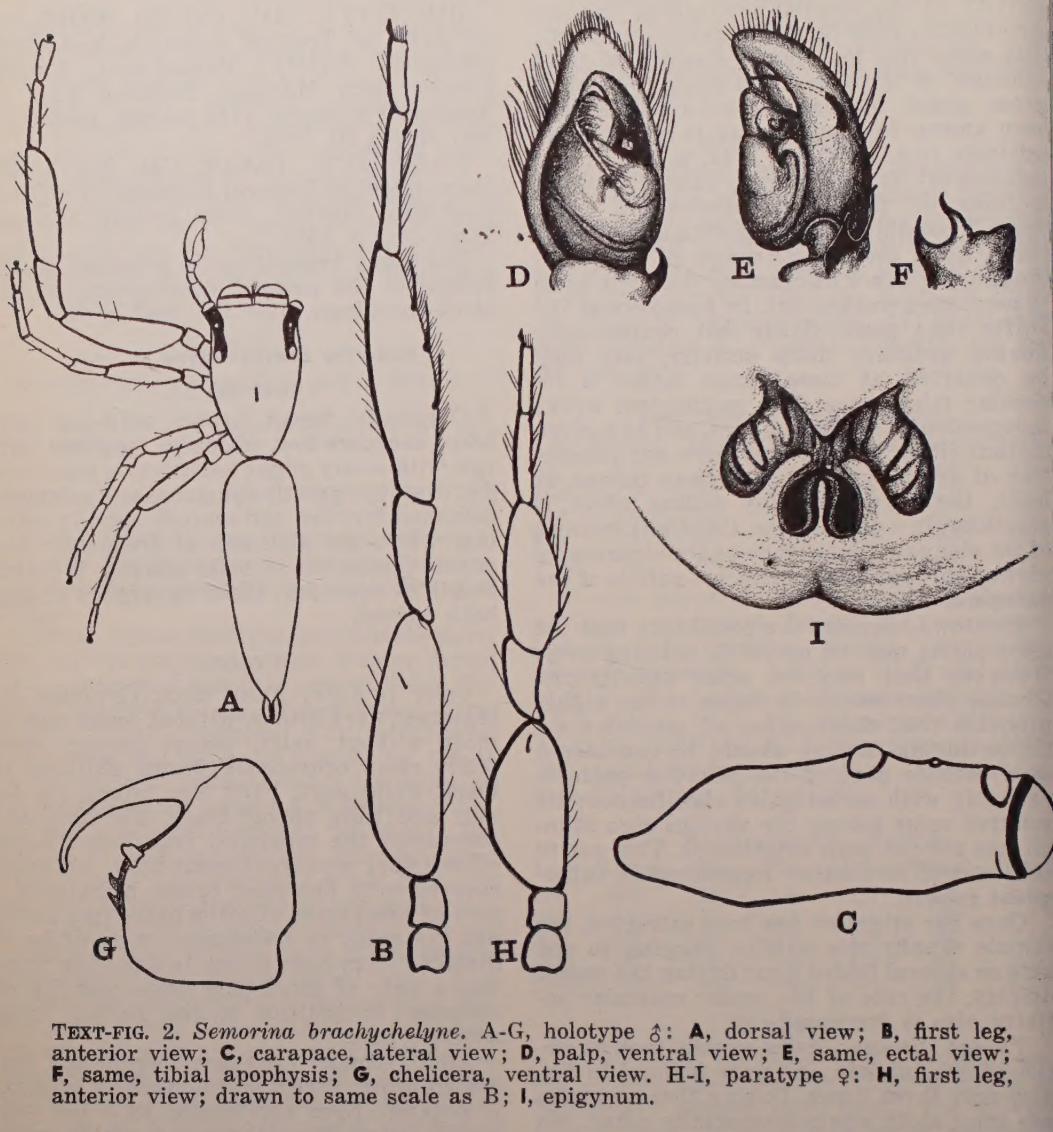
Adult female. Carapace integument yellowish-brown except sternum which is faintly pinkish. Eyes surrounded by a few yellowish hairs. Eyes themselves as in male. Tibia and tarsus of palps shiny silvery white, very conspicuous when vibrated. Swollen tibia of first legs with a ventral dark spot extending laterally; entire first leg darker than the others, which are pale translucent yellow-brown. Abdomen with a median, slightly darker stripe giving off three pairs of dark cross bars reaching middle of side. A median dark spot immediately before tip of abdomen.

Color in Alcohol: The white spot(s) of the male abdomen are practically invisible, the pattern now resembling closely that of the female, which is little altered from life.

Structure.

The characteristics below apply to both males and females unless otherwise specified; percentages approximated; measurements of types given on p. 37.

Carapace: Height only 30% of carapace length; postocular plateau long; thoracic



TEXT-FIG. 2. *Semorina brachychelyne*. A-G, holotype ♂: **A**, dorsal view; **B**, first leg, anterior view; **C**, carapace, lateral view; **D**, palp, ventral view; **E**, same, ectal view; **F**, same, tibial apophysis; **G**, chelicera, ventral view. H-I, paratype ♀: **H**, first leg, anterior view; drawn to same scale as B; **I**, epigynum.

slope slightly concave; width of carapace greatest at level of PLE, about twice height, and 60% of carapace length. Longitudinal groove well defined, in middle of postocular plateau.

Eyes: Eyes occupying slightly less than one-half length of carapace. Ocular quadrangle only a third as long as broad, the sides practically parallel but with PLE very slightly closer together than ALE. Carapace extending moderately beyond PLE at their level; PME median, or slightly nearer ALE than PLE. Diameter of AME about 21% of carapace length; ratio of eyes, holotype: AME : ALE : PME : PLE : : 100 : 41 : 7 : 3 : 41. AME practically contiguous, separated from ALE, which are recurved, by about one-third diameter of ALE.

Clypeus: Height in male only 5 to 6% of AME diameter, in female 11 to 12%.

Chelicerae: Short, divergent, 25% of carapace length in male, slightly shorter in female. Two small teeth on superior, one large on inferior margin.

Maxillae: Length 54% of width in male 64% in female; outer distal margin a blunted obtuse angle, not produced.

Lip: Width 55% of length in male, 78% in female. Sternal suture straight.

Sternum: Width 56% of length in males 53% in females. Anterior margin straight a little narrower than lip base, greatest width between posterior margins of first legs; posterior end tapering, blunt-tipped extending between fourth coxae; the latter separated by less than a quarter of their thickness.

Legs: Tibial indices: Holotype male, first leg 17, fourth leg 14; paratype female, first leg 23, fourth leg 12. First leg in both sexes much elongated and enlarged with the femur and tibia especially deep (tibia depth of first leg in male 30% of its length, in female 45%). See Table II for formula. Hair scant

ept as follows. In male, first tibia and atarsus with a short, moderately dense tral fringe of dark hairs, and a scantier sal one of pale hairs; second tibia with a y scant pale fringe, dorsally and ventrally, atarsus with a similar, slightly longer ventrally only; third and fourth legs h very scanty ventral metatarsal fringes y. Fringes of negligible development in ale.

TABLE II.

	1	4	2	3
de holotype	2.5	1.8	1.6	1.3
	1	4	2	3
male paratype	1.6	1.6	1.3	1.1

Spines: (From male holotype and female atype). Femur, dorsal 0-1-1-1 through-, the proximal two weak, bristle-like, es-ially in female. Patella spineless through-. Spines otherwise as follows: First leg: bia, ventral only 0-2-2-2, the latter not minal; metatarsus, ventral only 0-2-2. ond leg: Tibia, retro-ventral only 1-1-0; atarsus, male 0, female 0-2. Third leg: bia and metatarsus 0. Fourth leg: Femur, rolateral distal in male 1, in female 0; ia and metatarsus 0.

Abdomen: Very elongate and tapering in h sexes, the breadth about a third of gth, a very slight constriction near mid-

Palp: Femur practically straight; tibia re than one-half length of patella; two eral tibial apophyses, the more dorsal ger, tapering, recurved at tip, the more tral shorter, strongly curved antero-in-rdly. Embolus slender and tapering. Dis- part of bulb with a conspicuous, chiti-ed, knob-like protuberance directed out-rd.

Epigynum: An anterior pair of kidney-aped bodies, diverging posteriorly; a pos-ior pair, smaller and closer together, fol-ed by a pair of conspicuous small dark ts; a broad and shallow marginal notch.

MEASUREMENTS.

Male holotype. Total length in alcohol 5.3 n.; carapace length 2.2, breadth 1.3, height ; ocular quadrangle length .79, breadth ; diameter AME .46, ALE .19, PME .03, E .19; clypeus height .02; basal segment chelicera .55; sternum length .86, breadth ; patella breadth, 1st leg, .38, 4th .21; ab-men length 3.2, breadth .99.

Leg Measurements, Male.

g	Femur	Pat.	Tib.	Metat.	Tarsus	Total
	1.7	.89	1.5	.96	.48	5.5
	1.1	.51	.79	.65	.31	3.4
	.82	.38	.58	.68	.31	2.8
	1.1	.51	1.0	.89	.38	3.9
p	.72	.24	.14	—	.62	1.7

Female paratype. Total length in alcohol mm.; carapace length 2.2; carapace eadth 1.3; carapace height .65; ocular quadrangle length .79; ocular quadrangle breadth 1.2; diameter AME .45; ALE .19 PME .03, PLE .19; clypeus height .05; basal segment of chelicera .50; sternum length .96, breadth .50; patella breadth, 1st leg, .32, 4th .15; abdomen, length 3.2, breadth 1.1.

Leg Measurements, Female.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	1.1	5.8	.92	.65	.38	3.6
2	.82	.48	.62	.51	.44	2.9
3	.79	.34	.44	.55	.34	2.5
4	1.0	.48	.79	.75	.48	3.5
Palp	.65	.27	.24	—	.44	1.6

BEHAVIOR.

Locomotion: The movements of this spider in the field are absurdly reminiscent of those of scorpions or pseudoscorpions, and bear little resemblance to ant behavior. Their small size, however, makes the existence of an adaptive mimetic function extremely questionable. They are to be counted among the runners in the family, their progress being a rapid sort of scurry, with short jumps reserved for crossing gaps in the terrain, or, of course, for the final stage in catching prey. During running the palps are vibrated continually up and down, while the first legs are held straight out in front, the metatarsi and tarsi curved inward; these legs are often vibrated, scarcely or not at all touching the ground, almost as rapidly as the palps. Meanwhile the abdomen is frequently elevated and waved slightly, also in the vertical plane. Immature specimens show all these characteristics in progress, and they are typical of locomotion whether or not another individual is present. Both abdomen and first legs are invariably raised whenever any obstacle is encountered.

Courtship Display: Indistinguishable from ordinary locomotion except that the first legs are extended at a wide angle (more than 90%) and slightly more elevated, the tarsi usually bent down; often the palps are held still; there is the usual pursuit with sidling, and the abdomen, with increasing excitement, tends to remain elevated. Motionless posing with abdomen up and first legs extended at the usual angle, also occurs with excitement. In Stage II the first legs are brought close together in front, about as in simple locomotion. During courtship the female vibrates her white palps rapidly, once her attention has been gained.

Threat Display: No threat displays were seen, although a number of attempts were made to induce them.

Habitat: Known only from the montane cloud forest (about 3,600 feet) around Rancho Grande. Always shaken from shrubs and low trees.

Affinities: This species differs from Simon's Venezuelan species, known only from females (*S. seminuda* and *S. iris*, 1901), in the complete lack of shining abdominal scales in any specimens. It likewise appears distinct from Mello-Leitao's *S. lineata* (1945)

from the Argentine. No other species seem to have been referred to this genus. It differs clearly from the other Rancho Grande species (see below) in details of the chelicerae, palp and epigynum.

Material: A total of 5 adult males and 4 adult females have been preserved, in addition to a number of young. The following have been designated as types:

HOLOTYPE: Male. Cat. No. 481558, Department of Tropical Research, New York Zoological Society; Portachuelo, Rancho Grande, near Maracay, National Park of Aragua, Venezuela; 1136 meters; cloud forest; July 15, 1948.

PARATYPE: Female. Cat. No. 461200, Department of Tropical Research, New York Zoological Society; Limon Gorge, Rancho Grande, near Maracay, National Park of Aragua, Venezuela; 1100 meters; lower edge of cloud forest; April 20, 1946.

The name *brachychelyne* is proposed in reference to the relatively short chelicerae.

Semorina megachelyne sp. nov.

(Text-fig. 3).

Diagnosis: Very similar to *S. brachychelyne* in general appearance. Chelicerae elongated, about half carapace length in male; tibial apophyses of palp slender and straight.

Color.

Color in Alcohol: Both sexes scaleless, brown except for pale second, third and fourth legs; no distinct and unvarying spots or other markings.

Structure.

Does not differ significantly from *S. brachychelyne* except as follows: Height of carapace slightly more in male (33% of length instead of 30%); thoracic groove less distinct, transverse rather than longitudinal. ALE and PLE slightly larger, almost one half diameter of AME. Ratio of eyes, holotype: AME:ALE:PME:PLE::100:48:48. Clypeus even narrower, in both sexes about 4% of AME in male, 5.4% in female. Maxillae and sternum both narrower with little sexual difference in breadth.

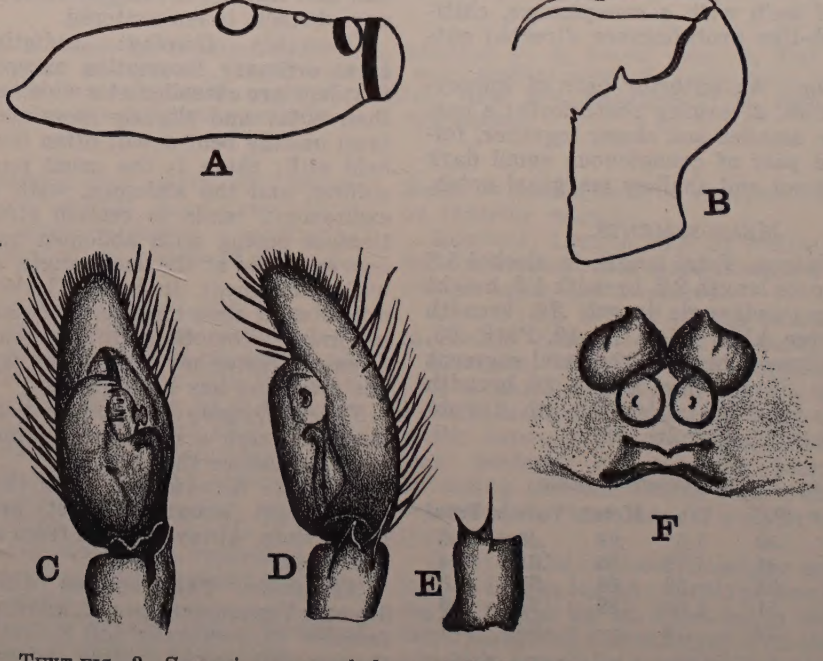
Chelicerae: These form a major specific difference, being long in males, the length of the basal segment 50% of carapace length in females it is only 30%. They are held almost horizontally in both sexes, but are more divergent in males than in females. Tooth on inferior margin relatively larger in males of present species than in *brachychelyne*.

Legs: Tibial indices: Holotype male, first leg 12, fourth leg 12; paratype female, first leg 20, fourth leg 15. General form, proportions and fringes similar to those in *brachychelyne*. The leg formula is given in Table III.

TABLE III.

Semorina megachelyne: Leg Formula.

	1	4	2	
Male holotype	2.3	1.7	1.5	1
	1	4	2	
Female paratype	1.5	1.4	1.1	1



TEXT-FIG. 3. *Semorina megachelyne*. A-E, holotype ♂: **A**, carapace, lateral view; **B**, chelicera, ventral view; **C**, palp, ventral view; **D**, same, ectal view; **E**, same, tibial apophysis. **F**, paratype female: epigynum.

pines: (From male holotype and female atype). As in *brachychelyne*, except for nd leg, as follows: In male, metatarsus coventral 1-0, not 0; female, as in *brachy-yne* male, except metatarsus is 1r-2.

calp: Differs from *brachychelyne* as fol-s: Both tibial apophyses are straight, the us along with its bulb is more slender, the coiling of the tubule within the bulb ifferent.

pigynum: The structure differs dis-tly in the two species, as shown in the re; the more nearly spherical shape of four bodies is especially noticeable.

MEASUREMENTS.

Male holotype. Total length in alcohol 4.7 .; carapace length 2.2, breadth 1.3, height ; ocular quadrangle length .79, breadth ; diameter AME .43, ALE .21, PME .03, E .21; clypeus height .02; basal segment helicerae 1.1; sternum length .96, breadth ; patella breadth, 1st leg .27, 4th .17; domen, length 2.5, breadth .82.

Leg Measurements, Male.

g	Femur	Pat.	Tib.	Metat.	Tarsus	Total
	1.5	.82	1.4	.96	.41	5.1
	.96	.51	.75	.62	.34	3.2
	.82	.38	.55	.68	.27	2.7
	1.1	.48	.92	.85	.38	3.7
lp	.72	.31	.17	—	.58	1.8

Female paratype. Total length in alcohol mm.; carapace length 1.7, breadth 1.0, ight .55; ocular quadrangle length .75, eadth .96; diameter AME .36, ALE .16, ME .03, PLE .17; clypeus height .09; chelі-a, basal segment .52; sternum length .79, eadth .36; patella breadth 1st leg .21, 4th g .14; abdomen, length 2.3, breadth .79.

Leg Measurements, Female.

g	Femur	Pat.	Tib.	Metat.	Tarsus	Total
	.79	.48	.58	.44	.27	2.6
	.62	.34	.41	.31	.24	1.9
	.55	.31	.34	.41	.27	1.9
	.79	.31	.62	.55	.27	2.5
lp	.44	.17	.14	—	.34	1.1

Behavior: Locomotion as in *brachychel-ne*. No displays observed.

Habitat: Known only from lower edge of ontane cloud forest, about 3,500 feet, near ancho Grande. Collected from tree trunks nd shrubs.

Affinities: See remarks under *brachy-elyne*.

Material: A total of 2 adult males and 5 dult females were taken, along with a num-er of young. The following have been des-nated as types:

HOLOTYPE: Male Cat. No. 461201, De-artment of Tropical Research, New York oological Society; Water Trail, Rancho rande, near Maracay, National Park of Ar-gua, Venezuela; 1100 meters; lower edge cloud forest; May 5, 1946.

PARATYPE: Female. Cat. No. 461202. ame data as holotype.

The name *megachelyne* is proposed in reference to the long chelicerae of the male.

Ashtabula furcillata sp. nov.

(Text-fig. 4).

Diagnosis: Color in life above entirely iridescent green with white dorso-lateral band encircling carapace and abdomen; dorsal abdominal spots lacking, although sometimes faintly indicated in alcohol; carapace low; abdomen elongate; tibial apophysis of male forked.

COLOR.

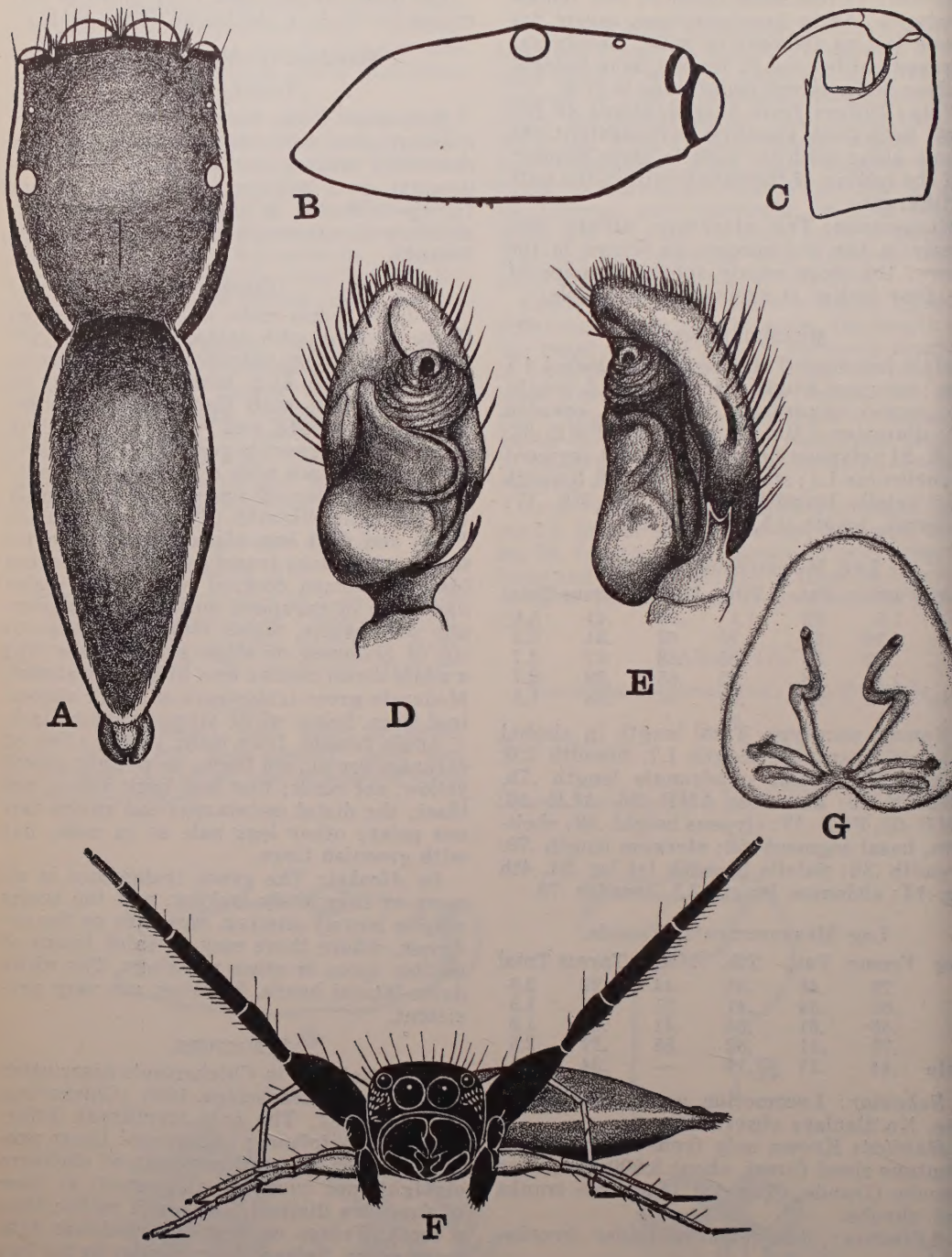
In Life: Adult male. Carapace above entirely covered with iridescent scales, rich green with bronze reflections. A white stripe starting behind ALE, bordered narrowly on ventral margin with black, passing immediately below PME and PLE, and extending along thorax almost to pedicel. Sides of carapace naked, black with a narrow white submarginal border of scales. AME narrowly rimmed with yellowish. Clypeus black, naked. Palps and first legs black (except pale 1st tarsi), other legs translucent buff. Sternum black. Abdomen covered with green scales like those of carapace, outlined dorso-laterally with white, which either continues to tip of abdomen or stops short of the tip; a white distal median spot present or absent. Moderate green iridescence on lower abdominal sides, below white stripe; venter black.

Adult female. Like male, except sides of carapace brown, not black; palps light green-yellow, not black; first legs dark brown, not black, the distal metatarsus and entire tarsus paler; other legs pale as in male, but with greenish tinge.

In Alcohol: The green iridescence is almost or completely lacking, and the scales may be largely missing, especially on the abdomen, where there may be faint traces of median spots or other markings. The white dorso-lateral bands, however, are very persistent.

STRUCTURE.

Essentially as in Chickering's description of *A. dentata* Cambridge, 1901 (Chickering, 1946, p. 248). The only significant differences are as follows: *Chelicerae*: Large prolateral tooth of basal segment of chelicera straight, not curved; enlargement at base of fang less distinct, a tubercle rather than a tooth. *Fringe* on first leg continues onto metatarsus. *Spines*: Very similar in the two species; the femoral prolateral distal spines tend to be more numerous than in *dentata* (first leg 2, not 1; 4th leg, male, 1 not 0, but 0 in female); metatarsal prolaterals tend to be fewer than in *dentata* (second leg 0, not 1; third leg 1, not 2); a weak fourth metatarsal ventral distal is present in *furcillata*, absent in *dentata*. Female *furcillata* as in male, except that femoral distal spines are reduced, about as in male *dentata*, and tibials are completely absent. *Palp*: Tibial apophysis differs radically from that of all pre-



TEXT-FIG. 4. *Ashtabula furcillata.* A-E, holotype ♂: **A**, carapace and abdomen, dorsal view; **B**, carapace, lateral view; **C**, chelicera, ventral view; **D**, palp, ventral view; **E**, same, ectal view; **F**, courtship display. **G**, paratype ♀: epigynum.

bly known males—*zonura* Peckham, , *dentata* Cambridge, 1901, and of *dentichelis, sexgutta* and *glauca*, all of Simon, ; in *furcillata* alone it is not simple, but lly forked.

MEASUREMENTS.

ale holotype. Total length in alcohol 4.2 ; carapace length 1.9, breadth 1.4, height ocular quadrangle length .82, breadth diameter AME .34; ALE .17; PME .04; .17; clypeus height .05; basal segment elicera 2.4; patella breadth, 1st leg, .19, .21; length of abdomen 2.3, breadth 1.1.

Leg Measurements, Male.

Femur	Pat.	Tib.	Metat.	Tarsus	Total
1.2	.79	.99	.79	.41	4.2
.82	.44	.55	.48	.31	2.6
.79	.38	.51	.51	.31	2.5
.99	.51	.72	.58	.34	3.1
.68	.14	.10	—	.62	1.5

emale paratype. Total length in alcohol mm.; carapace length 1.7; carapace adth 1.1; carapace height .68; ocular drangle .79; ocular quadrangle breadth diameter AME .33; ALE .17; PME .04; 17; clypeus height .03; basal segment helicera .36; patella breadth, 1st leg .26, .21; length of abdomen 2.0, breadth 1.0.

Leg Measurements, Female.

Femur	Pat.	Tib.	Metat.	Tarsus	Total
.82	.55	.62	.48	.31	2.8
.68	.38	.44	.38	.27	2.2
.68	.38	.38	.41	.31	2.2
.85	.44	.65	.51	.31	2.8
.44	.21	.41	—	.38	1.4

ibial indices: Holotype male, first leg 11, rth leg 17; paratype female, first leg 22, rth leg 19. See Table IV for formula.

TABLE IV.

A. furcillata: Leg formula.

	1	4	2	3
le holotype	2.2	1.6	1.4	1.3
	1	4	2	3
nale paratype	1.6	1.6	1.3	1.3

BEHAVIOR.

Locomotion: A scurrying run, the first legs d flat and low, straight in front of body; h they and the palps palpate the surface ost constantly during progress. During ses the first legs are usually elevated, and y and the palps jerked rapidly up and vn. Both *Ashtabula* and *Sassacus* are mass of backward running, and both can p well, although they never resort to it ept in crossing gaps and in the final stage prey capture.

Courtship Display: *Stage I.* Male carapace l elevated, abdomen swung to one side ually the left), where it is held low, practlly resting on ground; the spider sidles k and forth, raising the front legs at a le angle and waving them up and down in unison. The palps occasionally jerk up and down, but hang quietly during height of display. The white abdominal stripe and its bounding iridescence show clearly, little impeded by the short, pale, posterior legs. When the attention of a female has been gained, her pale, greenish-yellow palps jerk up and down rapidly and almost continuously, being conspicuous against her dark brown clypeus and mouthparts. *Stage II.* Not seen.

Threat Display: Inter-male display seems feebly developed in this species; three different pairs of males at various times, all in display condition, judging by their behavior toward females, paid little or no attention to each other, except for some brief elevation of the forelegs, which frequently takes place in any situation and appears to be of an exploratory nature.

Habitat: Known only from the montane cloud forest (about 3,600 feet) around Rancho Grande. Always taken on herbs, shrubs and low trees.

Affinities: Close to *A. dentata;* see remarks under *Structure*. It seems likely that *dentata, dentichelis* and *furcillata* will prove to be no more than subspecies of *zonata*.

Material: A total of 5 adult males and 1 adult female have been preserved. The following have been designated as types:

HOLOTYPE: Male. Cat. No. 461203, Department of Tropical Research, New York Zoological Society; Portachuelo, Rancho Grande, near Maracay, National Park of Aragua, Venezuela; 1,136 meters; cloud forest; June 15, 1946.

PARATYPE: Female. Cat. No. 481559, Department of Tropical Research, New York Zoological Society; same locality as holotype; July 21, 1948.

The name *furcillata* is proposed in reference to the characteristic forked tip of the palp's tibial spine.

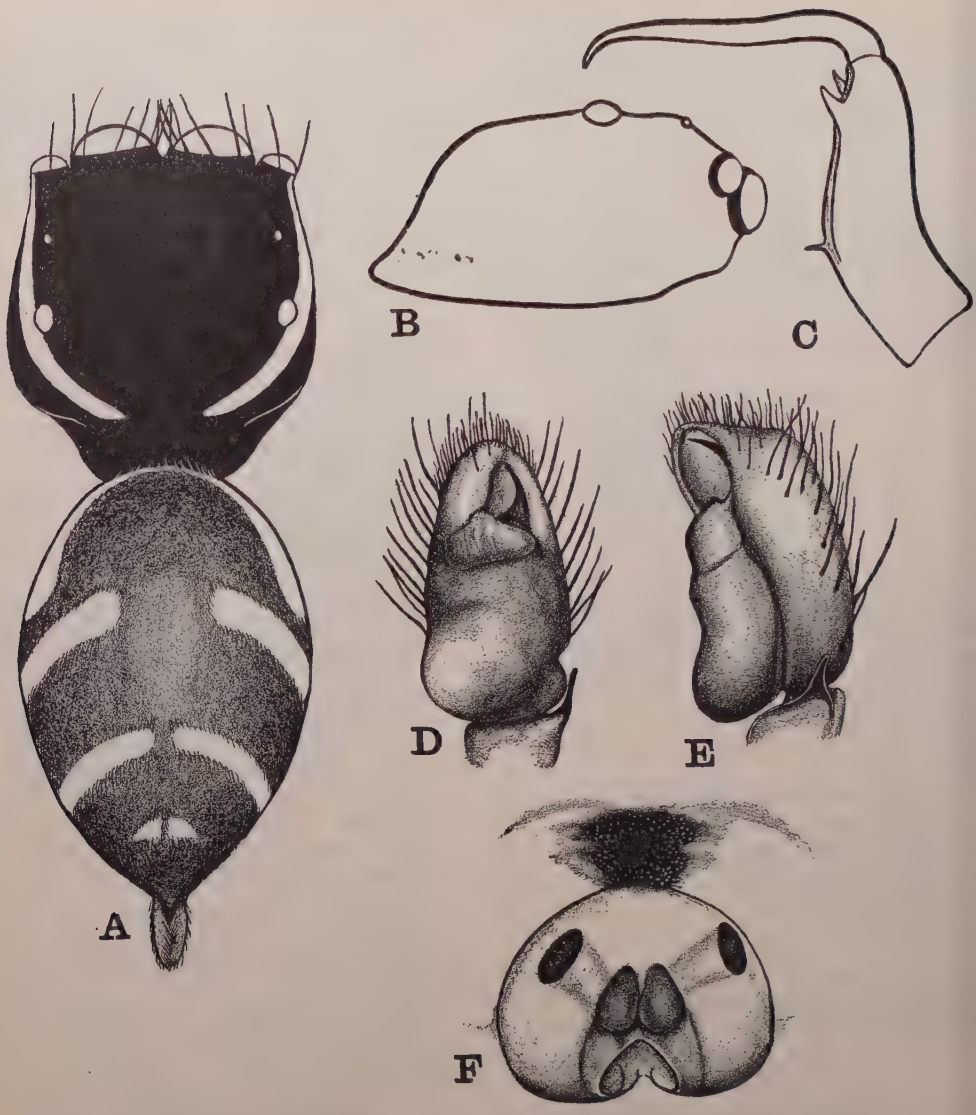
Sassacus flavicinctus sp. nov.

(Text-fig. 5).

Diagnosis: Male black with yellow on clypeus, in paired stripes and a submarginal band on carapace, and in transverse markings on abdomen. Female brown with obscure ochraceous markings. Chelicera of male strongly produced, the promargin with two teeth, far separated, the retromargin with a single strong tooth near distal end. Tibial apophysis of palp strong, simple, tapering, tip slightly recurved; embolus curved.

COLOR.

Color in Life: Adult male. Cephalothorax: Integument of carapace black, with a moderate number of long bristles in ocular region, and with lemon yellow (Ridgway) scales arranged in dense bands as follows: A pair on carapace just below dorsal eyes, converging slightly behind them and ending, without meeting, halfway down thoracic slope; a narrow submarginal band; a well-developed band of scales and scale-hairs



TEXT-FIG. 5. *Sassacus flavicinctus*. A-E, holotype ♂: **A**, carapace and abdomen, dorsal view; **B**, carapace, lateral view; **C**, chelicera, ventral view; **D**, palp, ventral view; **E**, same, ectal view. **F**, paratype ♀: epigynum.

completely covering and slightly pendent from the narrow clypeus. Mouthparts and legs black except as noted below; all tarsi brown; tibia and metatarsi of all except first legs banded brown and black in varying proportions; all legs with small anterior patches of yellow and white hairs and scales on some or all of the following segments: Femur, patella and tibia; these markings are highly variable. Sternum black with white hairs, which occur also on underside of coxae. Abdomen: A basal semi-circular band of lemon yellow scales continuing backward a third of abdominal length; behind this two pairs of short, curved bars, concave posteriorly, of which the posterior pair may join in the midline; at tip of abdomen a tiny round spot, or a short bar concave posteriorly, may be present or absent. Center black with a t angular patch of white hair, the apex p terior.

Adult Female. Cephalothorax: Carap black with rather weak markings of och ceous brown scale-hairs as follows: Acr clypeus and completely encircling sides carapace and thoracic slope, absent only middle of ocular quadrangle. Palps dark w yellowish hairs. Legs banded light and da brown. Sternum black.

Abdomen: Dorsum with an indistinct, terrupted reticulated pattern which consi basically of an anterior basal band, follow by several pairs of hollow bands; the lat do not meet in midline, but join with the p ceding band by a narrow stripe just bef the center; tip of abdomen covered w

aceous hairs. Venter black with a few ered light hairs.
l scale-hairs easily removed, and fre- tly absent in preserved specimens.

Structure.

ne characteristics below apply to both s and females unless otherwise specified; entages approximated; measurements of s given below.
arapace: Height about half (female) or tly less than half (male) of carapace th; anterior part of thorax flat, with a gentle slope, rounding into rounded s of cephalic part; descent of posterior (less than half postocular length) pt, slightly concave; width of carapace test a little behind PLE, 1.5 times height, (male) to 75% (female) of carapace th; thoracic groove scarcely indicated.
yes: Length of ocular quadrangle about as long as broad, its sides almost par- , though very slightly wider at ALE than LE; carapace extending slightly beyond at their level, PME slightly nearer ALE PLE. Diameter of AME about 20% of pace length; ratio of eyes, holotype: E: ALE: PME:PLE::100:48:8:44. E practically contiguous, separated from , which are slightly recurved, by about ighth of their diameter.
lypeus: Height 12% of AME diameter.
helicerae: In males strongly produced, almost parallel to ground, divergent; th of basal segment about three-fifths of pace length. Promargin with one slender h at proximal end of groove and one, , robust, triangular, far removed, near e of fang; slightly proximal to this on romargin a single large tooth. Fang slen- slightly sinuous. Chelicerae of females h shorter with a very short groove ked on promargin by two teeth close to- ner, the proximal the smaller, and one e tooth on retromargin.
laxillae: Width about 75% of length; r distal edge in male more dilated and sely angled than in female.
ip: Breadth more than 90% of length; al end reaching slightly beyond middle maxillae; sternal suture curved, especi- in male.
ternum: Width 62% of length in males; er, about 73%, in females. Anterior mar- concave, narrower than base of lip; atest width between first and second legs; terior end bluntly pointed, extending htly between fourth coxae; the latter arated by less than half their diameter.

TABLE V.

S. flavicinctus: Leg Formula.

	1	4	2	3
le holotype	1.8	1.5	1.4	1.35
	2	1	3	4
male paratype	1.8	1.65	1.7	1.4

Legs: Tibial indices: Holotype male, first leg 16, fourth leg 17.5; paratype female, first leg 26, fourth leg 23. First femur in both sexes enlarged, and entire first leg somewhat thickened and elongated in male. See Table V for formula. All legs with little hair.

Spines: (From male holotype and female paratype). Patella without spines throughout. First leg: Femur, dorsal 3 in distal half; prolateral distal 1 in male, 2 in female; tibia ventral only 1r-2-2, the two distal pairs close together, the proximal at beginning of second quarter of segment; metatarsus, ventral only, 0-2-2. Second leg differs from first in having tibia ventral 1r-1r-2, (male) or 1r-0-2 (female); tibia prolateral, male only, 1-1 (both small); metatarsus, female only, with 1 prolateral distal. Third leg, femur, dorsal 0-1-1-1, prolateral distal 2 (male), or 1 (female); tibia prolateral 0-1 (male) or none (female); retrolateral 0-1; ventral 0-0-2 (male) or 1p-1p-2 (female); metatarsus prolateral distal 2, retrolateral distal 2, ventral distal 2. Fourth leg, femur as in third; tibia prolateral none (male), or 0-1 (female); retrolateral 0-1 or none (variable on two sides); ventral 1p-0-2 or 1r-1r-2 or 0-0-2 (variable on two sides); metatarsus prolateral distal 0-1, sometimes in female only 0-2, the second weak; ventral distal only 2, on one side of female 0-2-2.

Abdomen: Ovate in both sexes, the breadth about 70-75% of length, widest near middle.

Palp: Femur strongly curved; tibia more than one-half length of patella; tibia with a retrolateral apophysis which tapers to a blunt, slightly recurved point. Embolus tapering from a broad base to a curved and slender tip.

Epigynum: An anterior pair of bodies well separated, a posterior pair contiguous; marginal notch deep and narrow.

Measurements.

Male holotype. Total length in alcohol 4.51 mm.; carapace length 2.4, breadth 1.6, height 1.0; ocular quadrangle length .79, breadth 1.4; diameter AME .43, ALE .21, PME .03, PLE .19; clypeus height .05; basal segment of chelicera 1.37; patella breadth, 1st leg, .31, 4th .24.

Leg Measurements, Male.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	1.3	.85	1.0	.72	.44	4.3
2	1.1	.58	.62	.62	.41	3.3
3	1.1	.48	.55	.68	.34	3.2
4	1.2	.55	.82	.75	.34	3.7
Palp	.79	.27	.17	—	.58	1.8

Female paratype. Total length in alcohol 4.68 mm.; carapace length 2.05, breadth 1.54, height 1.03; ocular quadrangle length .83, breadth 1.4; diameter AME .43, ALE .21, PME .03, PLE .19; clypeus height .05; basal segment of chelicera .72; patella breadth, 1st leg, .34, 4th .26.

Leg Measurements, Female.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	1.1	.65	.68	.55	.38	3.4
2	1.2	.51	.85	.72	.38	3.7
3	1.2	.51	.79	.68	.34	3.5
4	.92	.55	.55	.48	.34	2.8
Palp	.55	.24	.24	—	.38	1.4

BEHAVIOR.

Locomotion: Compared with *Ashtabula*, this *Sassacus* is somewhat more a jumper and walker, less a scurrier; also it palpates the ground far less with the first legs and palps. Compared to the spiders of the *Plexippus* group, however, it is a poor and reluctant jumper.

Courtship Display: *Stage I.* Male follows female about, the carapace moderately elevated and the first legs raised at a wide angle to each other; frequently lowered; the abdomen hangs down and is trailed inconspicuously from side to side with sideling. Display tends to be in a wide semi-circle around female, once her attention has been attracted. The long chelicerae are folded but held out laterally (when not displaying they are held at right angles to each other), and the palps extend straight out also, in contrast to their usual resting position when they hang over chelicerae. With increasing stimulation, zigzagging becomes more pronounced and a slow rocking is involved, the carapace and abdomen held stiffly and rocking as a unit. Stage II is usually attained within three to five minutes by couples of low threshold to display stimuli, and consists of the first legs thrust out in front, clear of the ground.

Threat Display: *Stage I.* Indistinguishable from Stage I of courtship, except that no rocking is involved. *Stage II.* It is only in the rare occurrence of this stage that the chelicerae blades are unsheathed; when two opponents are practically touching the first legs are brought upright, from the obliquely outward display position, and simultaneously the chelicerae blades are extended straight out in front, at right angles to the basal segment, which is maintained in the horizontal position typical of display. In each of the dozen or so observed encounters that reached this stage, one or the other male usually backed off promptly at this point; more rarely there was a brief tangle which ended without apparent injury. Usually one or both males retreated before reaching Stage II.

Habitat: Known only from the montane cloud forest (about 3,600 feet) around Rancho Grande. Always shaken from herbs, shrubs and low trees.

Affinities: This species appears exceedingly close to *S. arcuatus* Simon, 1902, from Teffe, in the Amazon region. From the brief description, the only apparent differences are slight distinctions in the abdominal markings and the absence, in the present form, of a yellow spot on the palp femur.

Material: A total of 5 adult males and 5 adult females have been preserved in addition to a number of young. The follow have been designated as types:

HOLOTYPE: Male. Cat. No. 45451. partment of Tropical Research, New Y Zoological Society; Portachuelo, Ran Grande, near Maracay, National Park Aragua, Venezuela; 1,136 meters; cloud f est; June 1, 1945.

PARATYPE: Female. Cat. No. 45452 partment of Tropical Research, New Y Zoological Society; same locality as holot (with which she mated); July 1, 1945.

The name *flavicinctus* is proposed in r erence to the yellow bands characterizing male.

Sassacus ocellatus sp. nov.

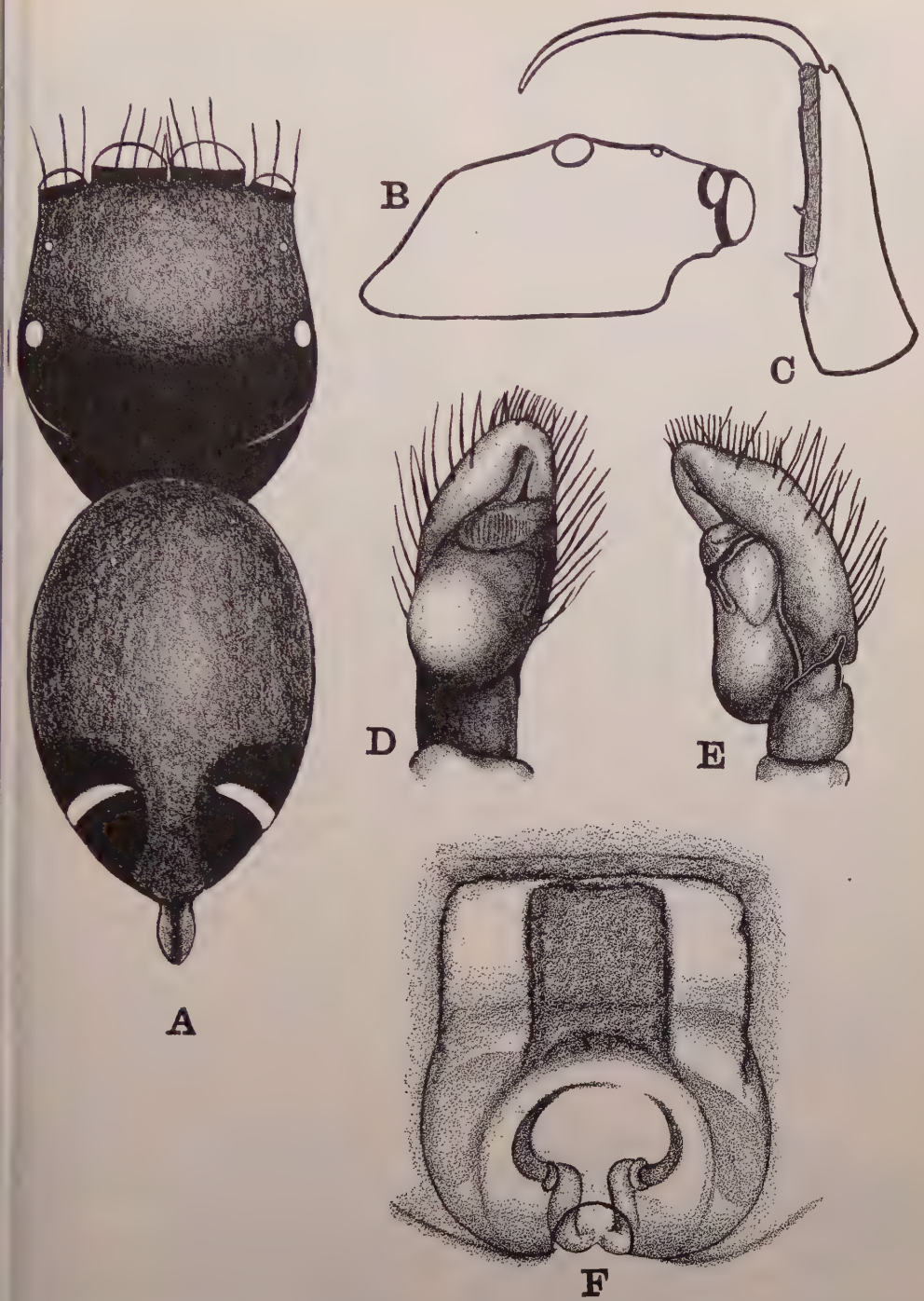
(Text-fig. 6).

Diagnosis: Both sexes iridescent gr above, with a pair of black spots, e crossed by a white bar, near tip of abdom Chelicera of male strongly produced, the p margin with two well-separated teeth proximal half, opposed by a single la tooth on retromargin. Spines of first ti 2-2-2. Tibial apophysis of palp strong, si ple, tapering, tip straight; embolus straight.

COLOR.

Color in Life: Adult male. Cephalothor Integument of carapace black; ocular reg with a number of long bristles and complet covered with iridescent green scales wh extend a little below it on sides and thora region. A broad band of white hairs, starti below PME on side of carapace, extends f ward across clypeus. Palps, mouthparts a first legs jet black; other legs brown; t narrow, conspicuous stripes of white sca extend along anterior and posterior sides first patella, tibia and base of metatars These scales, although progressively fe posteriorly, are present on anterior si of all other legs, as well as on posterior si of second legs. Sternum black. Abdomen tirely covered above, except as hereaf noted, with iridescent green scales, lar than those on carapace. On dorso-lateral s face on each side of posterior third is a la spot of velvety black scales, each with a n row cross-bar of white scales from one-th to two-thirds of the way to its poster edge. Around the entire abdomen laterall a narrow band of iridescent green, conflu except in region of spot, with the dor green. Venter black.

Adult female. Cephalothorax: carapace in male, with the addition of a narrow s marginal border of white scales continui almost as far as pedicel. Entire face, arou eyes, with more white scales and hairs th in male. Chelicerae black with a few wh hairs basally; palps translucent bro barred narrowly with darker on joints, with a few white hairs on patellae. All l translucent brown except first femora, wh are almost black. Sternum black. Abdom as in male, except that there is a faint



TEXT-FIG. 6. *Sassacus ocellatus*. A-E, holotype ♂: **A**, carapace and abdomen, dorsal view; **B**, carapace, lateral view; **C**, chelicera, ventral view; **D**, palp, ventral view; **E**, same, ectal view. **F**, paratype ♀: epigynum.

lor band of white scales, dying out later- in variable faint spots, while the white ss-bars on the posterior black spots tend oe on the latter's anterior margin.

n alcohol the iridescent green completely ishes, the scales appearing dull yellowish rownish; the abdominal black spots with te cross-bars are discernible, but far less distinct than in life, the anterior part of the spot tending to disappear altogether. As usual, the black integumentary areas fade to brown.

STRUCTURE.

Essentially as in *S. flavicincta* except in the following respects: carapace lower, its height less than half carapace length in both

sexes, lower in male than in female. *Chelicera* of male even longer in some specimens, but varying in individuals; basal segment in holotype is 5/6 of carapace length; promargin with two small teeth well separated, along proximal half of groove; opposite their interspace, on retromargin, is a single, much larger, conical tooth. *Tibial indices*: Holotype male, first leg 21, fourth leg 19; paratype female, first leg 25, fourth leg 19. See Table VI for formula.

TABLE VI.

S. ocellatus: Leg Formula.

	1	4	2	3
Male holotype	1.9	1.5	1.4	1.2
	1	4	2	3
Female paratype	1.7	1.7	1.3	1.3

Spines: As in *flavicinctus*, but with first tibial ventral 2-2-2, not 1r-2-2, and with spines on posterior legs somewhat fewer, viz.: Second leg: Male, tibia prolateral 0, not 1-1; female as in *flavicinctus*. Third leg: Male, femur prolateral distal 1, not 2; female, prolateral 0, retrolateral 1; tibia 0 in both sexes, not with a few pro- and retrolaterals and ventrals; metatarsus (both sexes) pro- and retrolateral distals each 1, not 2. Fourth leg (both sexes): Femur prolateral 1 not 2; tibia, ventral distal only 1p in male, 0 in female; metatarsus, as in third leg, but with traces of another lateral distal pair (very weak), similar to those in *flavicinctus;* especially noticeable in female.

Palp: Tibial apophysis and embolus both straight, not curved. *Epigynum*: Radically different from that of *S. flavicinctus* (see figure); marginal notch broad and shallow.

MEASUREMENTS.

Male holotype. Total length in alcohol 3.3 mm.; carapace length 2.1, breadth 1.5, height .79; clypeus height .07; basal segment of chelicera 1.8; patella breadth, 1st leg .34, 4th leg .22; length of abdomen 2.2, breadth 1.4.

Leg Measurements, Male.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	1.2	.72	.92	.65	.44	3.9
2	.89	.55	.62	.58	.38	3.0
3	.82	.44	.51	.48	.38	2.6
4	.99	.51	.68	.65	.38	3.2
Palp	.82	.55	.14	—	.58	2.1

Female paratype. Total length in alcohol 5.0 mm.; carapace length 1.7, breadth 1.3, height .72; clypeus height .10; basal segment of chelicera .58; patella breadth, 1st leg .31, 4th leg .21; length of abdomen 3.3, breadth 2.1.

Leg Measurements, Female.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	.85	.62	.62	.48	.34	2.9
2	.68	.48	.41	.38	.31	2.3
3	.68	.41	.41	.44	.31	2.3
4	.89	.48	.65	.55	.37	2.9
Palp	.44	.21	.21	—	.34	1.2

BEHAVIOR.

Locomotion: About midway between *A tabula* and *S. flavicinctus*. Its usual progr is a rapid scurry, jumping only when nec sary, the first legs held forward, usu scarcely touching the ground, the palps h just clear of it. During the infrequ pauses, the first legs and palps are raise the air and waved up and down; after wh both sets of appendages sometimes palp the ground itself.

Courtship Display: *Stage I.* Carap scarcely elevated, first legs held up at ab right angles to each other, and brought ground again during the jerking, zig- approach to female. The long chelicerae sheathed, the palps hanging quietly o them in the normal resting position, exc for occasional vibration. Approach to the male is often quick and direct after the p liminary zig-zags. The most interest phase may or may not be included; it c sists of posing for a few moments, moti less, the legs elevated, and the abdor twisted slightly to one side or the other; o the female was seen to perform the same tion, although that courtship was not c pleted. The relatively short abdomen never swung far to the side as in the e gate *Ashtabula*, and the black, white-ban terminal spot could not have been in view. In the single courtship which en in actual mating, this phase was altoget omitted. *Stage II.* This was often reac within three minutes; in one case mating lowed five minutes after display began did not differ from that of *flavicinctus*.

Threat Display: True fighting freque takes place in this species and even w inter-male display ends in mere threat, chelicerae are always more or less sheathed, which never happens in courts The behavior otherwise is similar except I observed little or no trace of the s swinging of the abdomen. During actual tle the first legs are raised directly overh and the palps extended laterally, w spread, out of the way; the wide-open ch cerae are opposed to those of the oppon The two may then push back and forth seconds, until one of the pair retreats o bitten.

Habitat: Known only from the mont cloud forest (about 3,600 feet) aro Rancho Grande. Always shaken from he shrubs and low trees.

Affinities: The abdominal markings somewhat similar to those of *S. auranti* Simon, 1902, from Para, Brazil, known from the briefly described female. The p ent species has a full set of 2-2-2 spine the first tibia, instead of 1p-2-2, in both se

Material: A total of 11 adult males a adult females have been preserved in a tion to a number of young. The follow have been designated as types:

HOLOTYPE: Male. Cat. No. 461204, partment of Tropical Research, New Y

gical Society; Portachuelo, Rancho de, near Maracay, National Park of ua, Venezuela; 1,136 meters; cloud for- March 27, 1946.

RATYPE: Female. Cat. No. 481560, rtment of Tropical Research, New York gical Society; same locality as holo- ; July 17, 1948.

e name *ocellatus* is proposed in refer- to the eye-like abdominal markings.

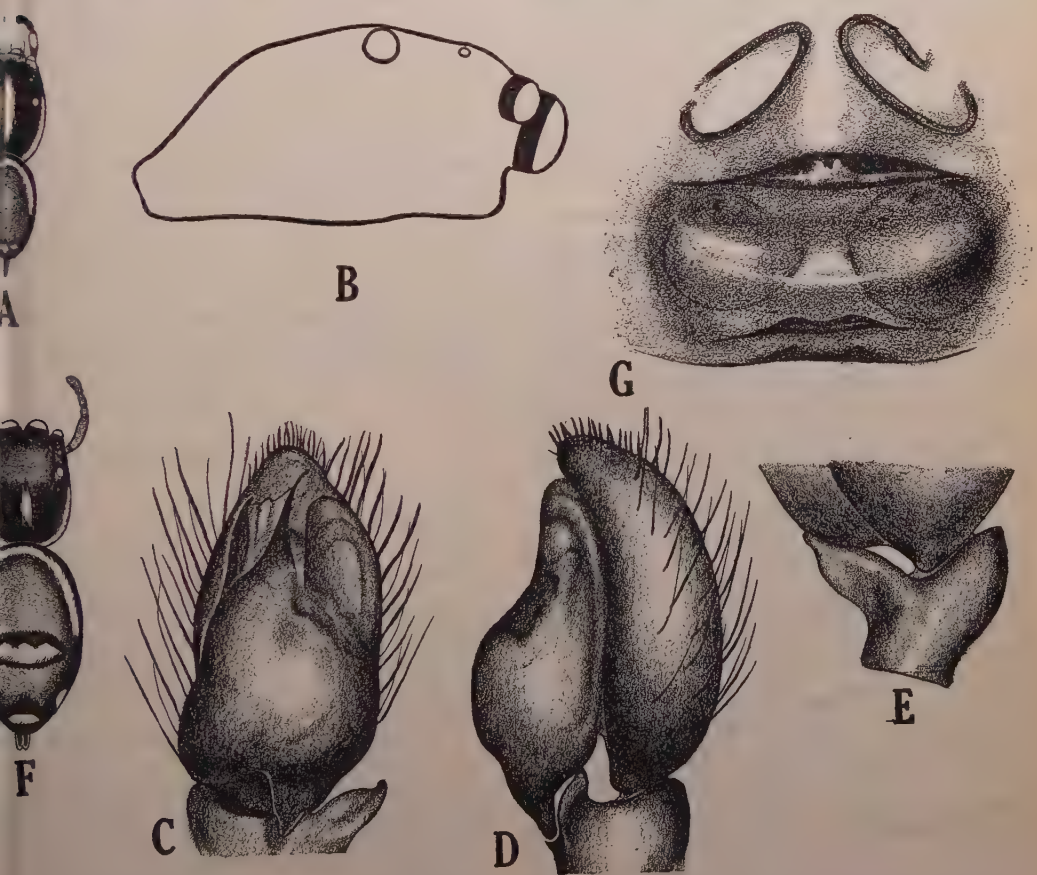
Phiale flammea sp. nov.

(Text-fig. 7).

agnosis: All carapace bands in both creamy yellow. Male: Carapace mark- broad, including submarginal and cly- bands and mid-dorsal stripe; no spots PME. Abdomen above bright rufous white markings; median spot absent, ough a faint cross-bar may be present or nt beneath rufous scales; no terminal on antero-lateral band; three terminal s. Palp with tibial apophysis stout, trun- ; bulb strongly bilobed; lateral process mbolus shorter than and widely separated embolus proper. Female: Carapace kings less extensive than in male. Ab- en with reddish scales ranging almost black; anterior abdominal band as in male; strong, post-median cross-bar and terminal spots present. Epigynum with two strongly chitinized, external cross-bars.

COLOR.

Color in Life: Adult male. As in Chickering's description of *P. aliceae* in alcohol (1946, p. 207), except as follows: Cephalothorax: Integument of carapace, mouthparts, palps and first legs (except metatarsus and tarsus) black, not dark brown; integument of other legs translucent, medium brown. All carapace scale-hair bands distinctly buffy yellow; anterior eyes rimmed with rust; clypeus with a strong band of creamy yellow scale-hairs, instead of only "a fringe of yellowish bristles;" palp femur with dorsal scale-hair patch as in *aliceae;* a patch of white-scale hairs on proximal anterior face of first metatarsus and tarsus; variable numbers and arrangements of similar scales, diminishing posteriorly, on other segments of other legs. Abdomen: Dorsum in full sunlight often matches the flame scarlet of Ridgway; other individuals tend to orange rufous. As in *aliceae,* white markings consist of a simple anterior band extending dorso-laterally more than halfway to spinnerets, and ending without a hook-shaped inward curve



TEXT-FIG. 7. *Phiale flammea.* A-E, holotype ♂: **A**, carapace and abdomen, dorsal view; **B**, carapace, lateral view; **C**, palp, ventral view; **D**, same, ectal view; **E**, same, tibial apophysis. F, G, paratype ♀: **F**, carapace and abdomen, dorsal view; **G**, epigynum,

(as is characteristic of *P. dybowskii*, for example); usually it ends abruptly; sometimes there is a very slight inward curve. The "narrow, light-colored central bar" of *aliceae* is invisible in live specimens though it sometimes shows in preserved examples, beneath the rufous scales. Three small white terminal markings, in the form of spots or short bars, as in *aliceae;* carapace stripe easily rubbed, often small in preservative.

Adult female. Exceedingly variable, both in the pattern of white and dark scales, and in the vividness of the reddish abdominal markings; the individuals are separated with difficulty in pattern from at least two other species occurring typically on the lower slopes of the same mountain range. They differ from the male as follows: Cephalothorax: buff stripe and bands of carapace—median, submarginal and clypeal—much less extensive; sparse rusty hairs usually present on and around ocular quadrangle; anterior eyes rimmed with yellowish-white, not rust; some buff hairs on face below ALE; palps translucent buffy yellow, not black, and lacking buff scales; first legs black only on femur and patella; white hairs and scales of all legs reduced or absent. Abdomen: Red of dorsum exceedingly variable, practically always less bright than in male, sometimes almost black. A strong post-median, black-bordered crossbar of white scales always present, but of variable length and breath, sometimes confluent with ends of anterior dorso-lateral band, which is as in male; posterior spots present as in male, but of more variable size and shape, sometimes partly confluent.

Structure.

This species is so close to *P. aliceae* (known only from holotype male) that no significant structural differences emerge from a comparison of Chickering's description with our species, except for minor spine and palp differences as given below. The females are closely similar to the males in structure, except for the usual leg differences, and for the absence of the small hooked maxillary process.

Spines (both sexes): Differ from *aliceae* as follows: First leg, Female: Patella prolateral 0, not 1. Second leg, both sexes: Tibia prolateral as in first (1-0-1, not 1-1-1), ventral apparently consistently 1r-2-2, not variable; metatarsus male, prolateral distal 0, not 1, but this spine present in female. Third leg (female only): Femur prolateral distal only 2, not 1-2, retrolateral 1, not 2; tibia dorsal 0, not 1; metatarsus with slight irregularities on one side of paratype female only, retrolateral 0-1-2, not 1-1-2, ventral 1p-1p-2, not 0-2-2. Fourth leg: Femur (both sexes) prolateral and retrolateral distal respectively 0 and 1, not each 2; male tibia as on right side of *aliceae* holotype, female dorsal 0, not 1.

Palp: Differs from that of *aliceae* in its relatively greater breadth and in the character of lateral process of embolus; *flammea* the two parts are much fart apart, though connected by a thin, ho plate; also, the lateral process is much sh er than embolus proper, and scarcely cur distally.

Epigynum: Confusing, as usual in t genus, on account of the frequent secret of gummy matter which obscures and torts the structure. Always distinct, h ever, are two strongly chitinized transve lip-like structures, one between the two pa of subdermal bodies and one near poste border.

Measurements.

Male holotype. Total length in alcohol mm.; carapace length 2.7, breadth 1.9, hei 1.1; clypeus height .19; basal segment chelicera .89; patella breadth. 1st leg, 4th .28; length of abdomen 1.9, breadth

Leg Measurements, Male.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	To
1	1.8	1.1	1.7	1.1	.68	6
2	1.3	.75	.89	.79	.48	4
3	1.5	.79	.85	1.1	.55	4
4	1.6	.75	1.2	1.3	.55	5
Palp	.85	.24	.24	—	.82	2

Female paratype. Total length in alcol 5.1 mm.; carapace length 2.5, breadth 1 height 1.1; clypeus height .07; basal segme of chelicera .85; patella breadth, 1st leg 4th .31; length of abdomen 2.6, breadth 1

Leg Measurements, Female.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	To
1	1.2	.85	.89	.65	.51	4
2	1.1	.65	.65	.62	.48	3
3	1.3	.72	.79	.82	.55	4
4	1.4	.72	.99	1.1	.62	4
Palp	.65	.27	.31	—	.55	1

Tibial indices: Holotype male first leg fourth leg 14; paratype female, first leg fourth leg 18. See Table VII for formu

TABLE VII.

P. flammea: Leg Formula.

Male holotype	1	4	3	
	2.4	2.0	1.8	
Female paratype	4	1	3	
	1.9	1.6	1.7	

Locomotion: Primarily a runner, althou jumps are undertaken over gaps witho hesitation. The first legs take little part locomotion and are habitually waved up a down during the pauses.

Courtship Display: *Stage I.* Carapace el vated high; abdomen hangs down, usual touching ground and leaving a silk threa First legs raised at 45° angle with each oth and the ground. Female approached in zi zag spurts, as the carapace is rocked fro side to side, sinking alternating almost the ground, from right to left. Palps irreg larly vibrated up and down. Pursuit of f male plays an important part in early stage

; once female's attention is gained, she ually watches with first legs elevated and ps vibrating rapidly.

Stage II. Male abruptly crouches almost ground, when two inches or less from male; his legs far outstretched in front, most parallel, he approaches her directly h crawling motion, the palps vibrating in ison and entire body quivering. The re-rkable point about Stage II in this species that it begins at such a relatively long ttance from the female.

Threat Display: As in Stage I of court-p, except that the palps are held quiet st of the time, the creamy yellow patch of curved femur continuing that of the cly-us in an unbroken line. When approach is y close the chelicerae are opened and the st legs spread more widely, often actually aching those of the opponent. The bouts e always brief and I have never seen dam-e inflicted.

Habitat: Known only from the montane ud forest (about 3,600 feet) around ncho Grande. Always taken on herbs, rubs or small trees.

Affinities: The closeness of this species to *aliceae* has already been noted. When ade-ate material is taken from intermediate alities, it seems likely that the distinc-ns will prove to be of only subspecific im-rtance.

Material: A total of 14 adult males and adult females have been preserved. The llowing have been designated as types:

HOLOTYPE: Male. Cat. No. 481561, De-rtment of Tropical Research, New York ological Society; Portachuelo, Rancho rande, near Maracay, National Park of ragua, Venezuela; 1,136 meters, cloud for-t; July 25, 1948.

PARATYPE: Female. Cat. No. 45453, De-rtment of Tropical Research, New York ological Society; same locality as holo-pe; July 26, 1945.

The proposed name *flammea* refers to the lor of the male dorsum.

Mago dentichelis sp. nov.

(Text-fig. 8).

Diagnosis: Carapace of unrubbed individ-ls with a median white stripe enclosing a ntral black spot. Male chelicera with tooth external border; four or five teeth on in-rior margin; two or three teeth, plus a ries of denticles, on superior margin; tibia palp with three unequal apophyses; igynum with a median, rounded, super-ial, pale anterior body.

Color.

Color in Life: Adult male. Cephalothorax: rapace integument black, practically ked except for a conspicuous median stripe white scales enclosing, behind level of E, a central black spot. The stripe begins hind AME, or near level of PME, widens encompass the spot, then narrows once more, ending at or behind middle of thorax. White of spot region sometimes extending laterally as a short cross-bar. Sparse chestnut and black hairs scattered on ocular quadrangle near dorsal eyes, and around AME. The wide clypeus is black and completely naked; palps, mouthparts and first pairs of legs black, except for leg tarsi. These and entire third and fourth legs translucent brown, variably and faintly banded with darker near ends of segments. Palps and all legs, especially first two, with inconspicuous white scale-hairs on antero-dorsal surfaces near joints. Sternum black. Abdomen: Pattern of dorsum very variable, formed chiefly of short hairs or scale hairs, brown mixed with gray and white areas. Usually a white lyre-shaped anterior marking—a strongly curved band with a short median basal stripe —is distinct; this is followed by several pairs of faint chevrons and some white lateral streaks and spots. The most constant markings are a pair of white terminal spots. Venter black with a pair of pale faint longitudinal stripes in middle; buff hairs rather thickly scattered over entire surface.

Adult female. Dorsal markings very similar to those of male, but posterior abdominal spots less distinct and more variable. Palps pale, translucent horn; first and second legs banded, not black; white scale-hairs on appendages almost or completely absent, though short yellowish hairs sometimes present near joints.

In alcohol, the distinctive markings usually disappear from both sexes.

Structure.

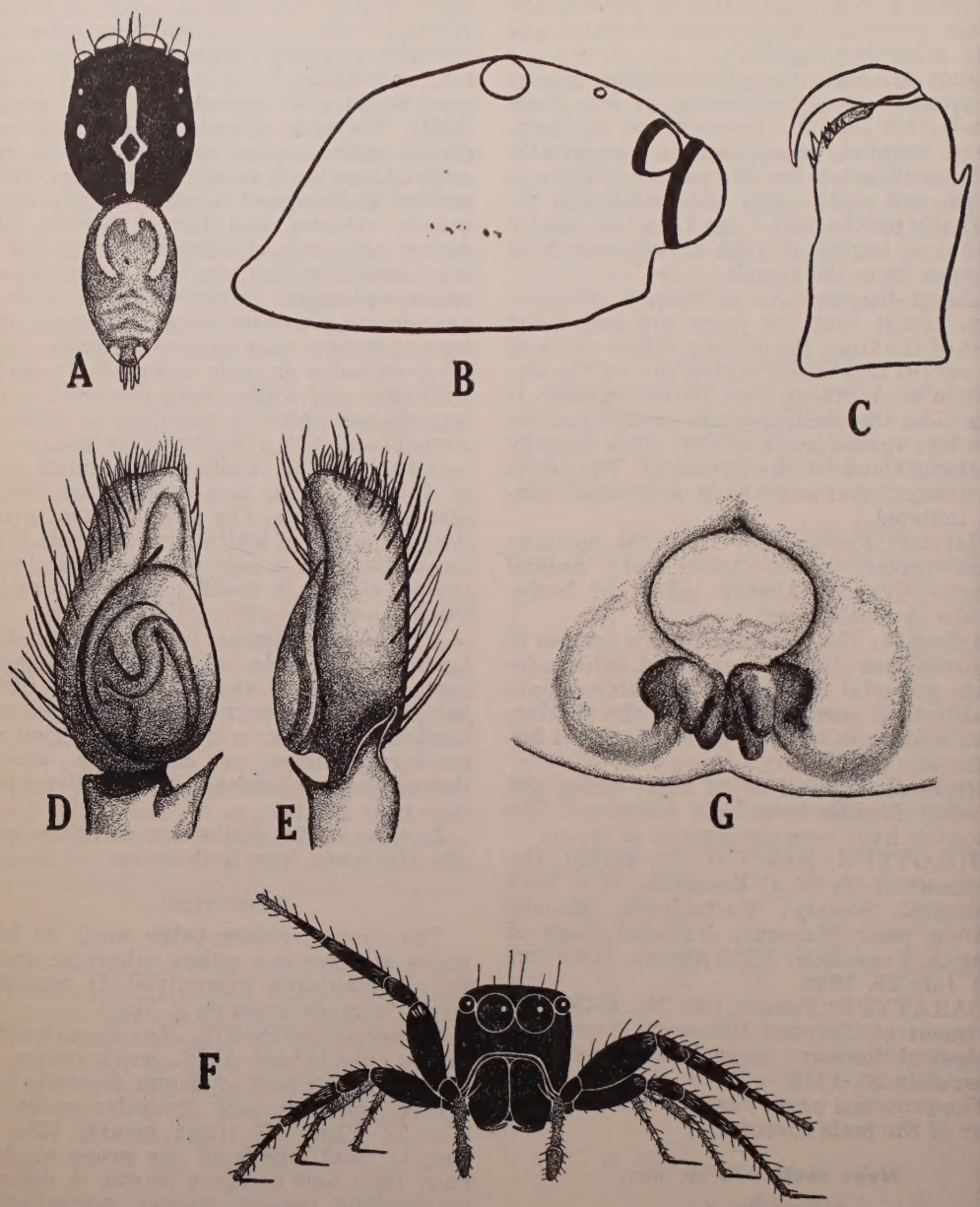
The characteristics below apply to both males and females unless otherwise specified; percentages approximated; measurements of types given on p. 51.

Carapace: Height 57% of carapace length; profile rises behind AME, gently convex, to PLE; anterior half of thorax descends very gently, posterior half abruptly; widest at level of PLE, 1.3 times height, 73% of length; total length of eye group slightly more than half carapace length. A distinct longitudinal thoracic groove, centering at level of posterior margin of PLE.

Eyes: Length of ocular quadrangle about two-thirds of breadth, its sides almost parallel but width at ALE slightly greater than at PLE; carapace extending well beyond PLE at their level; PME slightly closer to ALE than to PLE. Diameter of AME 23% of carapace length; ratio of eyes, holotype: AME : ALE : PME : PLE :: 100:46:14:40. AME practically contiguous, separated from ALE, which are slightly recurved, by about a tenth of their diameter.

Clypeus: Height 52% of AME diameter in male, 28% in female.

Chelicerae: Not produced, vertical, parallel. Length of basal segment less than 30% of carapace length. Male with a strong tooth about middle of external border. Promargin



TEXT-FIG. 8. *Mago dentichelis*: A-E, holotype ♂: **A**, carapace and abdomen, dorsal view; **B**, carapace, lateral view; **C**, chelicera, ventral view; **D**, palp, ventral view; **E**, same, ectal view; **F**, threat display. **G**, paratype ♀: epigynum.

with two (rarely three) moderate-sized teeth at proximal angle, the distal the larger; distal to these is a series of minute granular teeth, numbering three or more. Inferior margin usually with four, sometimes five, contiguous, well developed teeth.

Maxillae: Less than twice as long as wide, outer distal angle little dilated.

Lip: Length and breadth similar; posterior margin slightly convex, about equal in breadth to anterior margin of sternum.

Sternum: Breadth three-fourths of length in male, two-thirds in female, widest at an terior margin of third leg. Anterior borde concave, posterior broad and convex, endin before anterior half of fourth coxae; pos terior half of latter separated by about a eighth of their diameter.

Legs: Tibial indices: Holotype male, firs leg 17, fourth 29; paratype female, first le 23, fourth 16. First femur, patella and tibi moderately enlarged, less so in second leg See Table VIII for formula. All legs wit little hair.

TABLE VIII.

M. dentichelis: Leg Formula.

	1	4	3	2
ale holotype	2.1	2.0	1.9	1.9
	4	3	1	2
emale paratype	1.9	1.8	1.7	1.6

Spines: First leg: Femur dorsal 0-1-1-1, rolateral distal only 2; patella prolateral ly 1 or 0; tibial prolateral 1-0-1 (both eak), or 0-0-0; retrolateral 0; ventral, -1r-2, or 2-2-2; metatarsus ventral only 2. Second leg: Femur dorsal 0-1-1-1, prtteral distal only 2, retrolateral female only ; patella prolateral 1 or 0; tibia prolateral -1-1 or 1-0-1, retrolateral 0, ventral 1r-2-2; etatarsus ventral only 2-2. Third leg: emur dorsal 0-1-1-1, prolateral 1 or 2, retrtteral 1 or 0; patella prolateral 1, retrtteral 1; tibia prolateral 1-1, retrolateral -1-1; ventral 1p-0-2; metatarsus prolateral -1, retrolateral 1-2, ventral 2-2. Fourth g: Femur dorsal 0-1-1-1, prolateral 1, rerolateral 1; patella prolateral 1, retrolateral ; tibia prolateral 1-1-1 or 1-1, retrolateral -1-1, ventral 1p-2; metatarsus prolateral -1, retrolateral 1-1-2, ventral 1p-2.

Abdomen: Rather narrowly ovate, widest ear middle.

Palp: Femur slightly curved, tibia about 0% length of patella; tibia with three apohyses, one small and ventral, one long and apering, external to the first, and the third till larger, sinuously tapering, dorso-lateral. mbolus short and simple.

Epigynum: A large, rounded, median, whitish anterior area, followed by a variable rrangement of four or five subdermal, nearmedian tubules, related to two less distinct, vell separated oval bodies.

MEASUREMENTS.

Male holotype: Total length in alcohol 5.2 mm.; carapace length 2.6, breadth 1.9, height .5; total length of eye group 1.4; ocular quadrangle length 1.1, breadth 1.7; diameter AME .60, ALE .28, PME .09, PLE .24; clypeus height .31; basal segment of chelicera 99; sternum length .99, breadth .75; abdomen length 2.6, breadth 1.5; patella breadth, 1st leg, .41, 4th .39.

Leg Measurements, Male.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	1.6	.96	1.4	.99	.58	5.5
2	1.4	.89	1.1	.92	.58	4.9
3	1.6	.75	1.1	1.1	.48	5.0
4	1.5	.68	1.2	1.2	.62	5.2
Palp	.89	.38	.27	—	.68	2.2

Female paratype: Total length in alcohol 5.3 mm.; carapace length 2.5, breadth 1.8, height 1.4; total length of eye group 1.4; ocular quadrangle length 1.1, breadth 1.6; diameter AME .55, ALE .26, PME .09, PLE .24; clypeus height .15; basal segment of chelicera .79; sternum length .96, breadth .65; abdomen length 2.8, breadth 2.0; patella breadth, 1st leg .40, 4th .28.

Leg Measurements, Female.

Leg	Femur	Pat.	Tib.	Metat.	Tarsus	Total
1	1.3	.79	.96	.72	.38	4.2
2	1.3	.79	.85	.65	.44	4.0
3	1.4	.79	.92	.89	.51	4.5
4	1.5	.65	1.1	1.1	.58	4.9
Palp	.68	.41	.34	—	.38	1.8

BEHAVIOR.

Locomotion: Not specially observed in this species; however, another *Mago* (undescribed) as well as *Hypaeus* sp. are both excellent jumpers. In these the repeated pattern of ordinary progress is a deliberate walk for two or three centimeters followed by a series of short jumps; the first legs take active part in the walking and jumping, and are never raised except during display.

Courtship Display: *Stage I.* Carapace elevated only enough so that the motionless, hanging palps clear the ground; first legs raised at a wide angle to each other (about 135°), the other legs extending far sidewards, the second pair slightly forward. Posing in this attitude is extended, but at intervals the first legs wave alternately up and down. Meanwhile the abdomen, which is held horizontally clear of the ground, is occasionally vibrated briefly up and down.

Stage II. First legs extend to front, usually not before female thrusts her first legs momentarily forward. Carapace and legs of male, in addition to the abdomen, twitch and jerk before he touches her.

Threat Display: Much more active than courtship, and in several respects quite distinct. *Stage I*: Carapace held moderately low, the abdomen either straight out as in courtship, or relaxed downward for silk attachment. First legs held with femur bent obliquely up, the other segments out; from that joint the two legs are waved up and down, usually in unison with each other, sometimes alternately. The palps hang down outside the closed chelicerae, as in courtship.

Stage II. The tempo and span of waving increases, the first legs almost meeting overhead at peak of display. Series of waves are punctuated by the rapid rubbing together of the first and second tarsi of each side, the second legs are braced somewhat forward, as in courtship, and are occasionally lifted briefly from the ground during waving.

Stage III. The two males oppose each other closely, the first legs straight overhead, practically or completely touching, the palps swung obliquely out, and the chelicerae opened wide and knocking against each other for seconds at a time. I have seen this stage reached only twice, no injury being inflicted either time. Only when one was retreating did the abdomen twitch very briefly, as in courtship.

Habitat: Known only from the montane cloud forest (about 3,600 feet) around

Rancho Grande, taken from vines on tree trunks, herbs and shrubs. Several specimens collected on upper Rancho Grande verandah, many yards from vegetation.

Affinities: Apparently related to Simon's briefly described *longidens* and *acutidens* from Brazil, although distinct in details of white markings, distal dentition of chelicerae and presence of three apophyses on palpal tibia.

Material: A total of 6 adult males and 11 adult females have been preserved in addition to a number of young. The following have been designated as types:

HOLOTYPE: Male. Cat. No. 45454, Department of Tropical Research, New York Zoological Society; Portachuelo, Rancho Grande, near Maracay, National Park of Aragua, Venezuela; 1,136 meters; cloud forest; June 6, 1945.

PARATYPE: Female. Cat. No. 45455. Taken near holotype, same locality and date.

The name *dentichelis* is proposed in reference to the large outer tooth of the chelicera.

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